

# BLACK RIVER SURVEY REPORT 1981

## INTRODUCTION

A fisheries survey of the Black River main branch was started in June, 1981. The area covered was from the spreads on Black River Ranch upstream to McKinnon's Bend. The objective was to gather information on the fish populations. Gas and oil exploration was in progress south of the area in 1981 and will continue north of the river in 1982. We felt we needed more base line information. Since this involved a large commitment of time, we also decided to remove brown trout, common white suckers and burbot in an attempt to preserve brook trout dominance in this stream. The history of management and surveys is found in a previous report (Alward, 1976). Additional information on the winter fishery in Tower Pond will also be discussed.

## METHODS

Fish populations were sampled using a direct current electric shocker operating with a six or seven man crew. All brook trout were fin clipped on the first run thru and clipped again on the second run. Brown trout, suckers and burbot were removed. Selected areas were surveyed twice for direct proportion mark and recapture estimates on brook trout and DeLury estimates on brown trout. This data was pooled for each species and a "factor" was calculated to estimate trout populations in areas where no recaptures were done. This factor was generated by dividing the population estimate by the number of fish taken in the first run thru for each inch group. This factor is really the same ratio for both the direct proportion method and the DeLury estimate. The factor had to be adjusted for the small size brown trout because of the long time and subsequent growth between the first and second run. I used the factor from brook trout for inch group 1 thru 4 of brown trout. This introduces an error but was the best estimate we have.

All trout were measured to the nearest inch. All other species were counted. Scales from a sub sample (ten per inch group) were secured for age growth and survival determination. The first run thru started June 29, 1981 and ended August 28, 1981. Recapture runs were completed on September 23, 1981. Equipment breakdowns and other duties slowed progress on this project.

Weight estimates were generated using weights at mid points of inch groups times number per inch groups. The length-weight relationships were from AuSable Brook and Brown Trout supplied by Hunt Creek Research Station.

The winter fishery in Tower Pond was censused in February, 1981, following complaints of many brook trout being caught. A randomized, stratified instantaneous count for pressure and interviews of completed trips were used to estimate pressure and catch. I will discuss results and implications later.

Mileage was estimated using a small copper wire to conform to the river course on Aerial photos. Widths were taken off the 1971 Geological Survey map that was published by the Challenge Chapter of Trout Unlimited.

*Check.  
10 or 12 limit  
or flies only  
run thru*

Black River Survey Report 1981  
Page 2

RESULTS

Table 1 is a list of stations. Attempts were made to duplicate index stations that was sampled in 1975 and 1977. Blue pipes were used to mark stations in 1975 but only one pipe was discovered in 1981. There were 39 stations established in 1981 which included the 1975 stations as close as possible.

Table 2 shows river mileage, widths and area calculations used in standing crop estimates. Estimates were not done for each station but were broken down to obvious landmarks on the photos, like bridges, stream mouths and powerlines.

Table 3 lists estimated length frequencies of brook trout at all 39 stations. Recapture stations have an \* and all other stations were estimated using the "factor". Young of the year brook trout were found at all stations and reproduction appears to be more than adequate to maintain brook trout at the carrying capacity of the stream.

Table 4 compares brook trout 8" or over between 1975 index areas and 1981. There was a 30% drop in numbers of brook trout 8" and larger. There were three fish taken in 1975 in the 16-17" group and none in 1981. Some 15" fish were taken both years.

Figure 1 shows the standing crop estimates for the entire area surveyed in 1981. Brook trout had a standing crop just under 50 pounds per acre in the area between the Main River Bridge and McKinnon's Bend. Standing crops dropped to 3 pounds per acre just above the spreads.

There was a regulation change on size limit for brook trout with minimum size moved from 7" to 8" in 1979. In our index areas the number of 7" fish in 1975 was 358 and 1981 was 388 or an increase of 8%. This trend goes opposite of fish over 8" and indicates the size limit change did have an effect of protecting fish in the 7" group.

There were 1726 legal brook trout (8" or over) taken in the survey area. The survey area was approximately 1/3 of the best brook trout waters in the system. An estimate of harvest to anglers can be made by expanding the standing crop of legal fish to the total area ( $1736 \times 3 = 5208$  legal fish in system). The number of legal fish seen in the fall is at least equal to the harvest or can be 1/2 the harvest. A conservative estimate of harvest for the Black River brook trout would be 5,208 fish.

BROWN TROUT

Brown trout estimated populations and length frequencies are shown in Table 5. The main populations was still centered on Blue Lakes Ranch but were more numerous in other areas surveyed than in 1975.

Figure 1 shows standing crops of brown trout. This varied from almost zero to 11.5 pounds per acre on Blue Lakes Ranch.

## Black River Survey Report 1981

Page 3

Table 6 makes a comparison of # of 8"+ fish at various index stations for 1975 to 1981. This showed an increase of 300% in this 6 year period.

Table 7 indicates a decline in number of young of the year brook trout from 1975 to 1981. It appears that an increase in brown trout coincides with a decrease in brook trout standing crop. This competition follows the same trend that has been observed in other trout streams in Northern Michigan. Removal of brown trout was effective for the area surveyed.

Table 8 shows the % of browns removed on the first run and the reciprocal of this used to calculate population estimates of brown trout. These figures are really the DeLury estimate for estimating populations. The % figure was borrowed from brook trout population estimate for size groups 0-2.9"; 3-3.9" and 4-4.9" because of inconsistent data on brown trout. Apparently the long time period between the 2nd run allowed enough growth to make this size fish more vulnerable. Table 8 shows that removal varied from 29% to 100% for fish over 5" on the first run and from 49% to 100% for fish over 5" on both runs. This was a substantial reduction in brown trout from the survey area and should nearly eliminate reproduction for 1981. Brown trout are not mature until age II in most streams so I would expect little reproduction in 1982. If brown trout are removed in 1983 before spawning takes place, there should be few brown trout left since few young fish would be in the stream and age II fish would be vulnerable to removal with electroshocking equipment.

## OTHER SPECIES

A total of 3,652 suckers and 638 burbot were removed on the first run. These species were also removed on the second run but not tabulated. Other species that were common were black nose dace, muddler minnow, creek chub, mud minnow, perch and Johnney Darter. Species that were present in small numbers in the catch were pumpkinseed sunfish, rock bass and stickleback.

Tower Pond was censused for fishing pressure and catch in February 1981. This was in response to reports of large numbers of brook trout being caught thru the ice. We estimated that 100 brook trout were taken in February. This was a much higher catch than in 1976 when we estimated only 8 brook trout were taken in January. Apparently some years brook trout migrate more than others.

Of 8 brook trout tagged near Tower Pond in April 1976, two tags were returned. One the same year caught in the East Branch by Shingle Mill Bridge and another the next year on Black River Ranch. This indicates that brook trout move but this is little information on what part of the population migrates or how many fish may move into Tower Pond. The harvest of 200 brook trout from Tower Pond in 1981 may have been around 4% of the harvest for the year.

## GROWTH

Both brook and brown trout are growing faster than state average. This was similar to the situation in 1975.

Black River Survey Report 1981

Page 4

RECOMMENDATIONS

The biggest threat to maintaining the Black River as a brook trout stream appears to be the increase in brown trout. We should continue to monitor the population changes and remove brown trout again in 1983. This should slow the take over by browns and a removal may not have to be repeated again until ten years later.

The winter harvest of brook trout has been unacceptable to many sportsmen. To maintain the "traditional" aspects of the Black River brook trout, we should close Tower Pond to fishing except during the regular trout season. The big problem of northern pike and suckers not being harvested could be handled by treating the lower portion of the river with a fish toxicant to remove these species. This lower part of the river may never provide fishing for brook trout all season long because of the high temperatures encountered below the Spreads. Cooper (1947) indicated that temperatures was too warm below the spreads and that still appears to be the case. Any treatment to kill fish would require more information on fish populations in the lower part of the river.

If more larger brook trout (Over 12") are desired, or if fishing pressure continues to increase, there may be need to give further protection to brook trout. Special regulations of various kinds could be considered if there is public demand for this.

There is a need for more information on harvest throughout the system. An active fishery continues for large trout below Clark's Bridge and in the lower part of Canada Creek in the early season. The area below Clark's Bridge is difficult to survey with electro-shocking equipment so a creel census may be the best way to gather information.

If a brown trout removal is done again I recommend we take shorter periods of time between the second run to eliminate bias because of growth. Estimates of young fish were questionable in the 1981 survey because small fish become more vulnerable because of growth.

TABLE I. Description of Stations Used in 1981.

(All stations are contiguous and follow each other going upstream)

- Station 1. Upstream from spreads on Black River Ranch. This was an index station in 1975 but was not used for comparison because of a question on exact location. 2 hours shocking, Recap Station.
- Station 2. On Black River Ranch continuing upstream from boat landing. 1000', 2 hours shocking, recap station.
- Station 3. From large clay bank upstream. 3 hours shocking.
- Station 4. One fourth mile below rifle range to the East Branch mouth, 4 hours.
- Station 5. Upstream from mouth of the East Branch to the bridge on the ranch, 2 hours.
- Station 6. Upstream from bridge, 2 hours.
- Station 7. Above station 6, 3 hours.
- Station 8. Above station 7, 3½ hours.
- Station 9. One mile downstream of main river bridge upstream.
- Station 10. One half mile downstream of main river bridge upstream.
- Station 11. Index station. 1000 feet below main river bridge, 1 hour.
- Station 12. Index station. 1000 feet upstream from main river bridge, 2 hours.
- Station 13. Upstream from Gaylord Club buildings, 2 hours.
- Station 14. On Blue Lakes ranch. High banks to pine tree hole, 2½ hours.
- Station 15. From pine tree hole upstream, 3½ hours.
- Station 16. One fourth mile below picnic area, 3½ hours.

TABLE 1. Description of Stations Used in 1981

Page 2

- Station 17. From picnic grounds upstream to powerline, 2 hours.
- Station 18. Index station from powerline upstream past Sid's drive. 3100'. There is a spile in a 16" oak on the west bank on the right side at the powerline, 4½ hours.
- Station 19. Upstream above Hardwood Creek, 1.25 hours.
- Station 20. In Blue Lake swamp, 1/2 hour.
- Station 21. From poor sandy bottom streak, upstream from log dam to 1st. cabin, 3½ hours.
- Station 22. From 1st cabin or south line of Blue Lakes road upstream to Gill Mary cabin, 2½ hours.
- Station 23. Gill Mary cabin upstream, 3 hours.
- Station 24. 300 yards downstream from a north-south fence upstream to a marked rock.
- Station 25. Index station 2200 feet. From the marked rock (white cedar with spike on left bank) to Town Corner Landing, 2 hours.
- Station 26. From Town Corner station upstream (Bruot Cabin).
- Station 27. Started at 2nd private forty upstream from Town Corner Lake to unmarked public road. There was a powerline and beaver dam in the middle of this section, 4 hours.
- Section 28. Upstream to Public Landing above County line, 3½ hours.
- Section 29. From Runoff and Smith cabin upstream to campground on the river, 3 hours.
- Station 30. Upstream from Dingfellers, 4 hours.

TABLE I. Description of Stations Used in 1981  
Page 3

Station 31. 200 yards above Chandler Dam upstream, 4 hours.

Station 32. Upstream to Beaver Dam Club, 4 hours.

Station 33. Beaver Dam Club to PawNee Club, 3 hours.

Station 34. PawNee Club Dam upstream to Tin Shanty station.

Station 35. Index station. From 1000 feet below Tin Shanty Bridge to 1000 feet above bridge, 2 hours.

Station 36. Upstream from Tin Shanty station approximately 1/2 way to McKinnon Bend, 4 1/2 hours.

Station 37. Below McKinnon Bend Station, 3 hours.

Station 38. Below McKinnon Bend Station, 4 hours.

Station 39. Index Station 1000 feet below McKinnon Bend to access.

Stations 1, 2, 11 thru 28, 35 and 39 were all recapture stations.

Stations 3 thru 10, and 29 thru 34, 36 thru 38 were only shocked once.

TABLE II. River Mileage, Width and Area Calculated From Aerial Maps and U.S. Geological Survey Map 1971.

<u>STREAM SECTION</u>	<u>LENGTH (feet)</u>	<u>WIDTH (feet)</u>	<u>AREA (acres)</u>
McKinnon Bend to Tin Shanty	21,854	18.75	9.93
Tin Shanty to turn in the road	12,600	35.42	10.25
From turn in the road to powerline	6,800	38.54	6.02
Powerline to west of Camp 30 rd.	8,600	36.46	7.20
West of Camp 30 to powerline	9,600	39.57	8.72
Powerline to Main River Bridge	13,400	36.46	11.22
Main River bridge to Ranch bridge	13,800	27.08	8.58
Ranch bridge to East Branch	3,400	27.08	2.11
East Branch to Boat Launch	11,200	50.00	12.86



Table 3 Estimated Length Frequencies and Population of Brook trout at all stations (\* = recapture stations)

Station	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2.9	97	55	44	53	57	42	48	125	252	140	187	787	1088	1134	3960	3285	3395	1171	2477
3.9	9	7	11	11	19	15	52	149	220	124	153	643	692	917	2424	2431	1329	1199	1045
4.5	2		4	1	6	8		13	20	16	15	155	73	184	219	232	125	82	56
5.9	2	1	14	29	30	43	44	76	101	54	51	197	155	402	378	342	157	319	87
6.9	4	6	24	34	46	44	78	120	105	51	40	133	114	106	373	178	131	212	86
7.9	3	4	5	14	18	15	17	46	24	20	22	78	32	33	76	66	50	94	17
8.9		6	5	3	7	10	6	10	5	1	2	12	14	16	36	28	23	19	6
9.9	1	2	2		2	4	2	12	2	3	3	4	3	6	9	6	5	14	1
10.9		1		3	1	1	1	8	2		1	2	1	1	3	6		6	1
11.9				1	1	2	3	1	1	3	1	3	2	2	1			2	
12.9		1		1				1	1			2	2	1	2		1	3	
13.9						1					1		1		1			1	
14.9												2						1	
15.9				1															

Station	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
---------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

2.9	1531	2080	2300	1026	780	274	433	517	621	505	767	838	319	31	607	19	6	1	4
3.9	1399	176	1126	848	558	556	470	444	545	379	748	838	528	40	413	50	17	17	146
4.9	103	59	82	109	35	59	33	40	57	47	60	66	71		97	27	25	15	24
5.9	90	98	161	117	127	193	170	121	176	170	171	166	115	20	65	65	72	52	33
6.9	166	83	165	124	135	228	185	127	124	190	145	130	114	20	107	117	132	78	55
7.9	100	28	70	68	67	97	102	58	54	85	51	56	50	10	78	105	111	17	47
8.9	55	12	24	9	20	42	37	18	21	30	17	18	26	3	25	37	35	26	12
9.9	7	11	16	6	11	19	17	7	11	12	15	13	17		10	23	16	10	2
10.9	7	5	2	3	5	18	12	13	3	12	9	10	10	1		25	17	10	3
11.9	0	2	3		1	4	2			3	5	3	5	2		17	13	6	1
12.9	2	1	1	1			1	2	1	1	1	2	2	1	2	5	13	1	
13.9				1				2							1	2	3	1	
14.9	1	1	2												2	1	1	1	
15.9																1	1	1	

Table 4 Comparison of numbers of 8" + small lines at side stations in 1981 and 1975

<u>Station</u>	<u>1981</u>	<u>1975</u>
Revere Board	18	68
Tin Shanty	51	32
Town Corner	37	50
Is Drive	46	80
Main R. Bridge	<u>31</u>	<u>28</u>
	183	258

Table 6 Comparison of numbers of 8" + small lines at side stations in 1981 and 1975.

<u>Station</u>	<u>1981</u>	<u>1975</u>
Revere Board	0	1
Tin Shanty	3	0
Town Corner	20	4
Is Drive	26	10
Main R. Bridge	<u>6</u>	<u>4</u>
	55	19

Table 5 Population Length Frequency  
for Combined area

Inch Group	Stations				
	1-4	5-11	12-17	18-24	25-29
2-2.9	26	746	1743	4457	43
3-3.9		98	234	2714	122
4-4.9		-	-	26	-
5-5.9		8	25	117	2
6-6.9	1	21	51	164	4
7-7.9		-	10	66	21
8-8.9	1	3	20	33	1
9-9.9	2	13	21	57	
10-10.9		3	10	100	7
11-11.9		3	5	21	6
12-12.9		-	3	9	2
13-13.9		3	3	12	1
14-14.9		1	3	16	1
15-15.9		1	1	7	2
16-16.9				2	2
17-17.9				1	6
18-18.9			1	7	1
19-19.9					1
20-20.9					
21-21.9			1	1	1
22-22.9				1	
23-23.9			1		
24-24.9					
25-25.9					
26-26.9				1	

# Table 7

Comparison of Book + not 404  
from 1975 - 1981

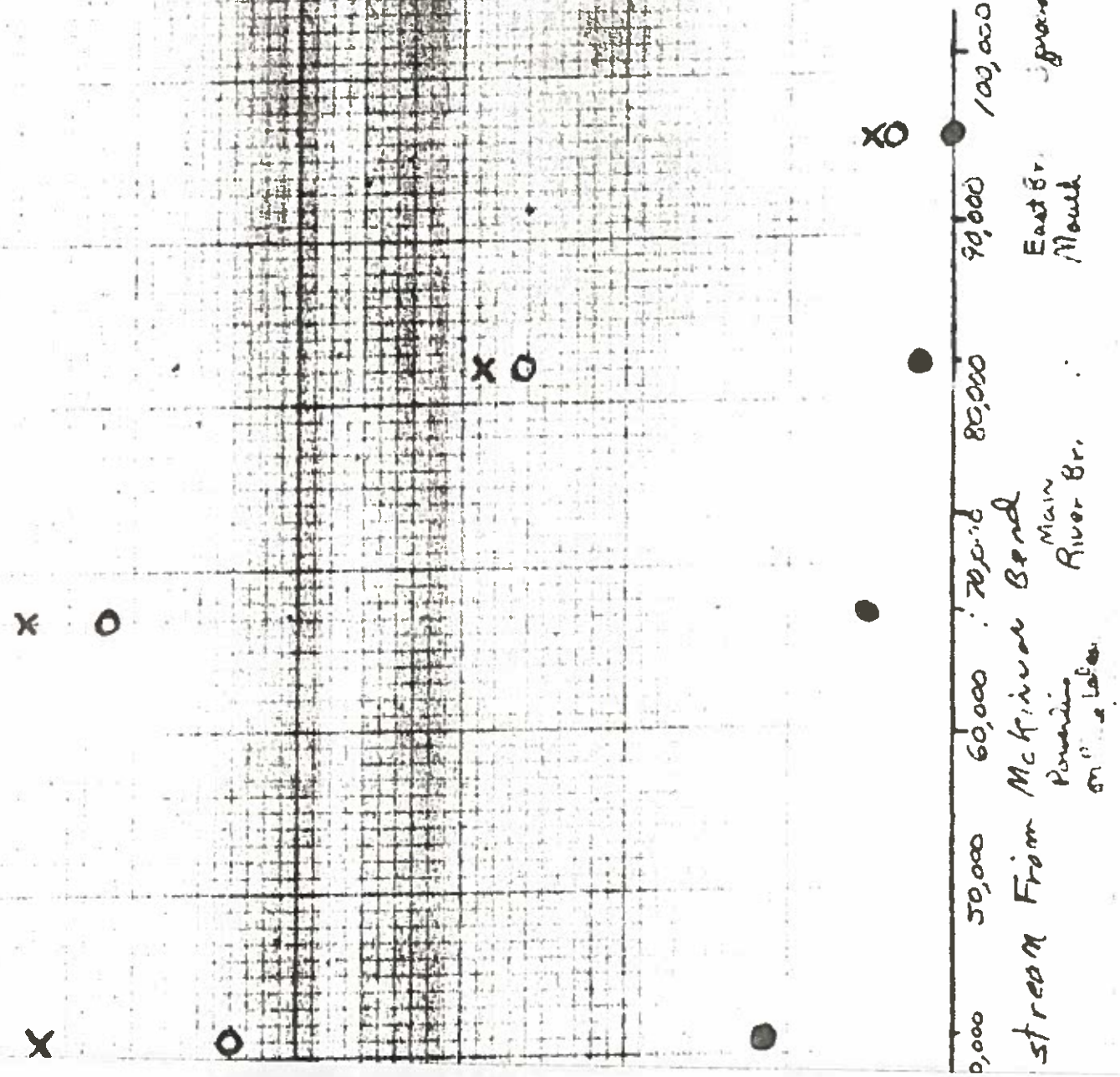
1975 1981 ~~1975~~ 7

	1975	1981		
1. 1975	378	284		
2. 1976	175	1073		
3. 1977	995	1617		
4. 1978	2054	2452		
5. 1979				
6. 1980				
7. 1981	2427	5366		

Table 8 % of Browns removed on 1st run, 2nd run and the "Factor" used for population estimate (DeLury).

Inch Group	% removed on 1st run	% removed on 2nd run	Factor
0 - 2.9	11.5		8.672
3	21.3		4.671
4	30.7		3.293
5	64.	87	1.5624
6	90.	96	1.250
7	68.	97	1.470
8	73.	100	1.075
9	61.	84	1.639
10	29.	49	3.448
11	66.	86	1.515
12	80	100	1.250
13	75	100	1.333
14	88	100	1.136
15	100	100	1.
16	100	100	1.
17			
18		100	1.136
19			
20			
21	100	100	1
22	100	100	1
23	100	100	1
24			
25			
26	100	100	1

Crop (lbs/acre) Brook  
Brown and Total Trout



0,000 50,000 60,000 70,000 80,000 90,000 100,000

stream From  
McKinnon Bend  
Panama  
on Lake  
Main River Br.  
East Br.  
Mouth